Requirement 3. will allow for the update rate to be increased for higher frequency transducers when the aperature changes faster for a given display depth. The same amount of memory will be used except that it will be addressed at a faster rate since the total depth will be shorter. Typical depths for 7.5 mhz transducer is 40mm which is only 52 microseconds.

The calculation of the coefficient gain will be done at transducer select for all the possible modes. The following is a table for the data modes that will need to be normalized with different blocks of memory.

Echo (even element density)
Echo (odd element density)
2D color flow (even element density only)
Single Gate Doppler
CW Doppler

5.6 Mechanical/Annular Interface, Pulsed and CW Doppler

This interface will use the same interface as the linear/phased path, the exception being that the samples it receives will already have been processed on the mechanical/annular module. The IF Output module will receive two I and Q samples and send them through the same path as the processed data path. Upon receiving the correct command message from the Beamformer Controller the IF Output module will set up the paths to have a gain of one. The filter control unit will use the microcode for this data processing modalilty and will multiply them with a gain of one and send them to the output FIFOs.

5.7 Filter Controller and FIR Filter

The main responsibility of this block is to the receive the RF Data that has been normalized for this data processing mode and to perform the bandpass filter demodulation which creates the output IF samples. These are the Inphase and Quadrature samples (I and Q). This block is made up of two sections, a data path and a control path. The data processing path will consist of two sets of 6 multilply accumulate stages (MACS) whose outputs of each set are tied together. Each stage will consist of a MAC and coefficient memory (8Kx8) which will be controlled by a microcoded sequencer. The microcoded sequencer defines the timing of the control path. The control section defines the length of the bandpass filter and how many MAC stages are to be turned on. The length of the filter is called the Impulse Response Length (IRL). It is an integer number of [redacted] Mhz cycles in length.

The number of MACS being used is a function of the data output rate desired and the order of the filter required in order to synthesize a bandpass filter for this output rate. If the output decimation rate is high ([redacted]mhz a decimation of 2) then all 6 Macs and their